ABSTRACT

An ADSL front end is implemented with an adaptive AM interference canceller to cancel out either a carrier signal of an interfering AM radio signal, or a carrier signal and its sidebands of an interfering AM radio signal, from a received ADSL signal. By canceling an interfering AM radio signal rather than simply filtering out the relevant interfered with frequency band, the interfered with frequency band remains useable for ADSL transmission. In one embodiment, a reference AM radio receiver is either fixedly or adaptively tuned to the carrier frequency of an interfering AM radio station, and the received signal in the frequency band surrounding that carrier frequency is digitized and provided to an adaptive interference canceller. The adaptive interference canceller adaptively adjusts a time delay and phase of the generated AM interference signal to optimize cancellation at a hybrid of the same AM radio signal received as interference over a subscriber line. The AM interference canceller may include a Hilbert bandpass filter, tuned to an appropriate carrier frequency by, e.g., an FFT analyzer. An LMS module adaptively adjusts the parameters of the I and Q channels of the Hilbert filter. In another embodiment, instead of including a reference AM radio receiver, only the carrier signal is removed from the received ADSL signal, leaving the presumably less significant sidebands intact. Preferably, a ratio of differential mode coupling to common mode coupling of the interfering AM radio station is determined to result in a better cancellation of the coupled AM interference signal.